

Appl. No. 09/482,023
Amdt. dated Sept. 25, 2003
Supplemental Reply to Final Office Action of April 28, 2003
And Advisory Action Dated August 25, 2003

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REMARKS/ARGUMENTS

Applicant acknowledges receipt of the Final Office Action dated April 28, 2003 and the Advisory Action dated August 25, 2003. In the Final Office Action, the Examiner: 1) rejected claims 18, 20, 31-33 and 35 under 35 U.S.C., 112 as allegedly containing subject matter not described in the specification; and 2) rejected claims 10, 15-20 and 30-36 under 35 U.S.C. 103(a) as allegedly unpatentable over Admitted Prior Art in view of Takada et al (JP 61-222939). In the Advisory Action, the Examiner noted that the application was not in condition for allowance because: 1) the proposed amendments present additional claims without canceling a corresponding number of finally rejected claims; 2) the proposed amendments do not include the text of withdrawn claims 22-29; and 3) the written reply to the Final Office Action does not include a statement of the substance of the interview conducted on July 21, 2003.

In the Final Office Action Response dated July 28, 2003, the Applicant amended claims 18 and 20, maintained the withdrawal of claims 22-29, and submitted new claims 37-40 for consideration by the Examiner. These amendments are shown in this Supplemental Response to reflect amendments made relative to the last entered amendment. Applicant also made certain arguments in response to the Examiner's rejections, such arguments being reproduced below in sections II-IV for the convenience of the Examiner. Applicant respectfully notes that the amendments and arguments made in the July 28, 2003 Final Office Action Response were made to present the claims in better form for allowance, and, more importantly, to address rejections made by the Examiner which were not previously presented. The Examiner's rejections based on Takada

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et al. had not previously been presented, and no translation of the Takada reference was provided to the Applicant despite its use in forming the Examiner's rejections. Thus, the amendments and arguments presented by the Applicant in the Final Office Action Response were necessary to properly address the Examiner's rejections, and were not earlier presented because the Applicant did not have the benefit of the Takada translation.

In this Supplemental Response, the Applicant has: 1) cancelled claims 16, 30, 33 and 36 so that new claims 37-40 have been added while the Applicant has cancelled a corresponding number of finally rejected claims; 2) added the text of withdrawn claims 22-29; and 3) included a statement of the substance of the Interview conducted on July 21, 2003, which is provided below. Applicant believes that the Final Office Action Response and this Supplemental Response place the pending claims in condition for allowance over the art of record and respectfully requests reconsideration.

I. INTERVIEW SUMMARY OF 21 JULY 2003

The Applicant's representative, Adele Noon (52,077), conducted an Interview by telephone with Examiner's Basia Ridley and Jerry Johnson on July 21, 2003. The prior art discussed included Admitted Prior Art and Takada et al. (JP 61-222939), which was used by the Examiner to reject all pending, non-withdrawn claims in the application. The Applicant notes that the Examiner's Interview Summary included with the August 25, 2003 Advisory Action provides the substance of the Interview, and will be substantially reproduced below, although not in its entirety.

The Applicant's representative argued that one of ordinary skill in the art would not have used the teaching of Takada to modify the gasifier disclosed in the Admitted Prior Art because the

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Admitted Prior Art is directed to a quench gasifier for producing syngas, while Takada discloses a trough structure having a different shape and purpose. The Examiner stated that this is not found persuasive. Takada states that the design and placement of a heater in a trough will prevent a slag coating from forming on the trough wall. Since slag solidification on gasifier combustion chamber walls is a known problem, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the gasifier design of Admitted Prior Art by adding the heater of Takada et al., which is known to prevent slag solidification on a trough wall. One of ordinary skill in the art at the time the invention was made would recognize that a heater used to heat a wall can be used in various applications, regardless of overall shape of the entire apparatus, without changing principles of its operation. Therefore, when looking for modification, which would prevent slag solidification on walls, one of ordinary skill in the art would utilize teachings regarding solutions to such problem, which can be found in various application, and not just in one specific application, such as quench gasifiers. The Examiner states that the Applicant's representative has not presented any convincing evidence showing why one of ordinary skill in the art would not expect that the heater of Takada et al. would not work in the gasifier of Admitted Prior Art.

Again, the Applicant respectfully notes that, in response to the Examiner's last statement above, the Applicant made certain arguments in its Final Office Action Response (reproduced below in sections II-IV) that do show why one of ordinary skill in the art would not expect the heater of Takada to work in the quench gasifier combustion chamber of Admitted Prior Art (see

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section III specifically). As stated before, these arguments did not become clear to the Applicant until the Examiner provided the Takada translation upon which the Examiner's arguments were formed.

II. SECTION 112 REJECTIONS

In the Office Action dated April 28, 2003, the Examiner rejected claims 18, 20, 31-33 and 36 as allegedly containing subject matter not described in the specification.

A. Claim 18

In particular, the Examiner correctly stated that claim 18 recites the limitation "ratio in the range from 3 to 7" while the specification does not disclose any range from 3 to 7. Thus, the Applicant has amended claim 18 to state "ratio in the range from 3 to 6." Applicant respectfully submits that this amendment puts claim 18 in line with the subject matter described in the specification. Applicant respectfully submits that this amendment is merely to correct a grammatical error, and therefore that this is not a narrowing amendment which would give rise to *Festo*-type inquiries.

B. Claim 20

Examiner also rejected claim 20 because "the specification does not mention the relationship between the inner diameter of the quench ring and the diameter of the throat outlet, nor any benefits associated with controlling said relationship." Figure 1 shows that the old design includes a quench ring inner diameter approximately equal to the throat outlet diameter D_2 . The new design in Figure 3 comprises a quench ring inner diameter significantly greater than the throat

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outlet diameter D_4 . Therefore, Applicant has amended claim 20 to retain the limitation "said quench ring has an inner diameter that is greater than the diameter of said throat outlet" while eliminating the limitation "said quench ring inner diameter being sufficiently large to substantially prevent damage to said quench ring." Applicant respectfully submits that this amendment puts claim 20 in line with the subject matter described in the specification. Applicant respectfully submits that this amendment is not a narrowing amendment which would give rise to *Festo*-type inquiries.

C. Claim 31

The Examiner further rejected claim 31 because allegedly "[n]either the drawings, nor the specification disclose heating element extending from said outlet of the throat to said inlet of the throat." Applicant respectfully submits that the specification does describe a heating element extending from the throat outlet to the throat inlet. The specification states that the "[electrical heating] concept can also be applied...to the entire hot face of the combustion chamber." Specification as amended (hereinafter called "Specification"), p. 5, 3rd para. The specification also states that the "concept of electrical heating of the refractory can be extended to the entire gasifier hot face." Specification, p. 6, last para. The "hot face" of the gasifier, combustion chamber or throat is defined as "the innermost layer...that is exposed to the hot gases." Specification, p. 3, 2nd para. A heating element that extends to the entire gasifier or combustion chamber hot face, which includes the hot face of the throat area, necessarily includes a heating element that extends over the entire hot face of the throat, or from the throat outlet to the throat inlet.

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Applicant respectfully submits that all of the subject matter claimed in claim 31 is sufficiently described in the specification, and thus the Examiner's Section 112 rejection with respect to claim 31 has been addressed.

D. Claim 32

The Examiner rejected claim 32 because the "specification does not disclose any specifics of the recited heating element," with the recited limitation being "said heating element is a spirally wound member having a first diameter near said throat inlet and a second diameter near said throat outlet, wherein said first diameter is greater than said second diameter." First, as discussed above with regard to claim 31, the specification describes a heating element having a first diameter near the throat inlet and a second diameter near the throat outlet. Second, Applicant respectfully submits that Figures 3-5 show heating elements wound spirally around the throat, as seen in Figures 3 and 5, or wound spirally between the throat surfaces, as seen in Figure 4. Lastly, Applicant respectfully submits that Figure 4 shows a heating element having a greater diameter near the throat inlet than its diameter near the throat outlet, and Figure 5 shows a horizontal combustion chamber also having a spirally wound heating element where its diameter near the throat inlet is greater than its diameter near the throat outlet.

Therefore, Applicant respectfully submits that all of the subject matter claimed in claim 32 is sufficiently described in the specification, and thus the Examiner's Section 112 rejection with respect to claim 32 has been addressed.

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E. Claims 33 and 36

The Examiner rejected claims 33 and 36 because the specification allegedly does not "disclose a heating element extending from said outlet to of the throat to above said inlet of the throat." Applicant incorporates by reference the discussion with respect to claim 31 where it was argued that the specification discloses having a heating element that extends to the entire combustion chamber hot face. Applicant respectfully submits that such a heating element would extend from the throat outlet to above the throat inlet.

Therefore, Applicant respectfully submits that all of the subject matter claimed in claims 33 and 36 is sufficiently described in the specification, and thus the Examiner's Section 112 rejection with respect to claims 33 and 36 have been addressed.

Based on the foregoing, Applicant respectfully submits that all the Examiner's Section 112 rejections have been addressed.

III. SECTION 103 REJECTIONS

The Examiner rejected claims 10, 15-20 and 30-36 under 35 U.S.C. 103(a) as allegedly unpatentable over admitted prior art in view of Takada et al. With respect to claims 10 and 34, the Examiner states that allegedly "[i]t would have been obvious to one having ordinary skill in the art at the time the invention was made to add an electrical heating element between said inner and said outer surfaces, as taught by Takada et al., in the apparatus of Admitted Prior Art, for the purpose of preventing slag solidifying in the throat."

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Takada teaches pre-heating a trough to 1000°C (1832°F), then decreasing the temperature until the operation (running the slag) is performed at 800°C (1472°F). Translation of Takada et al., entitled "Heating Trough" (hereinafter called "Takada"), pp. 4-5. The intended purpose of operating the trough under these conditions is to provide a temperature high enough so that the slag will not solidify, thereby preventing generation of a slag coating. Takada pp. 2-5. Therefore, Takada describes only an environment of a trough, which is not suggested to be any part of a gasifier or other reactor, but simply a trough, that provides an operating temperature of 1472°F.

The present specification describes heating the throat of a gasifier combustion chamber to at least 3000°F for the purpose of preventing slag solidification, especially those slags containing vanadium trioxide (V₂O₃) or other metals or metal compounds that solidify at temperatures lower than 3000°F. Specification, pp. 2, 4. However, heating the throat is also intended to increase gasifier carbon conversion, increase syngas production, reduce steam consumption and increase temperatures inside the gasifier without increasing oxygen consumption. Specification, pp. 3, 6. The high temperatures obtained by heating the throat will increase the carbon conversion of the gasifier by 0.1 to 3.0 percent, and decrease the steam requirement for the gasifier from approximately 0.25 to 0.35 pounds of steam per 1.0 pound of feedstock to approximately 0.15 to 0.25 pounds of steam per pound of feedstock. Specification, p. 6.

Takada does not teach a temperature high enough or environment suitable to prevent solidification of slags containing vanadium trioxide (V₂O₃) or other metals or metal compounds that solidify at temperatures lower than 3000°F. Takada teaches an environment including a

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trough, which is not suggested to be any portion of a gasifier, and an operating temperature (1472°F) less than half of the minimum preferred (3000°F) by the description in the specification. Furthermore, the invention of Takada cannot achieve the other benefits mentioned above. Therefore, the teachings of Takada are insufficient to suggest the proposed modification to the prior art gasifier for its intended purpose. Under *In re Gordon*, 733 F.2d 900 (Fed. Cir. 1984), "if [the] proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification." MPEP § 2143.01. Thus, there is no motivation to combine Takada with the prior art gasifier.

In addition to there being no motivation to combine Takada with the prior art gasifier, there is no reasonable expectation of success for making the modification because the Takada invention was intended for a trough, having a different shape than a throat and not being suggested as part of a gasifier reactor environment, being heated to much lower temperatures than those temperatures found in the throat of a gasifier. A reasonable expectation of success for making a modification is necessary in order to combine prior art references. MPEP § 2143.02; *In re Merck & Co., Inc.*, 800 F.2d 1091 (Fed. Cir. 1986). There is no suggestion in Takada that the materials used for the refractory (surface layer) or heating element, nor the construction of the trough as the trough is intended to be used, are satisfactory for the intended purposes of the present invention. Moreover, it is reasonable to assume that Takada discloses a heated trough including a heating element that is not satisfactory for use in a gasifier environment having temperatures two times as high as those

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described in Takada. Therefore, there is no reasonable expectation of success in modifying the prior art gasifier using the teachings of Takada.

Based on the foregoing discussion, Applicant respectfully submits that claims 10 and 34, and all claims which depend from claims 10 and 34, either directly or indirectly (claims 15-20, 30-33 and 35-36), should be allowed.

IV. NEW CLAIMS 37-40

Applicant respectfully requests consideration of new claims 37-40 as they are intended to more clearly reflect allowable subject matter in accordance with the specification, all of the Examiner's rejections and comments made heretofore and the discussions described herein. It is not the Applicant's intent to add claimed subject matter requiring a new search by the Examiner, but simply to add clarity to the claimed subject matter in view of the Examiner's rejections and comments to date. Support for the new claims can be found in the specification.

V. CONCLUSION

Applicant respectfully notes that this Supplemental Response is intended to both carry forward the amendments and arguments made in the Applicant's Final Office Action Response and to respond to the Examiner's Advisory Action such that the application is placed in condition for allowance. Applicant respectfully requests reconsideration, allowance of the pending claims and a timely Notice of Allowance be issued in this case. If the Examiner feels that a telephone conference would expedite the resolution of this case, she is respectfully requested to contact the undersigned.

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In the course of the foregoing discussions, Applicant may have at times referred to claim limitations in shorthand fashion, or may have focused on a particular claim element. This discussion should not be interpreted to mean that the other limitations can be ignored or dismissed. The claims must be viewed as a whole, and each limitation of the claims must be considered when determining the patentability of the claims. Moreover, it should be understood that there may be other distinctions between the claims and the prior art which have yet to be raised, but which may be raised in the future.

A Request for Extension of time is enclosed. If any fees are inadvertently omitted or if any additional fees are required or have been overpaid, please appropriately charge or credit those fees to Conley Rose, P.C. Deposit Account Number 03-2769.

Respectfully submitted,

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